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AUTHOR Messerschmidt, Dale H.
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ABSTRACT

The problem of teaching industrial arts to students with special educational needs is addressed. Some of the handicaps of special education students are considered, including retardation, sight, hearing, neurological, orthopedic, and gross motor problems, learning disabilities, emotional disturbances, and multiple handicaps. The prevocational industrial arts special education program in which the author is involved is described. Several individual problems concerned with students' academic, social, emotional, and physical handicaps are discussed, along with demonstrated methods of handling them. The author then looks at some usual industrial arts activities and compares special education achievement with achievement found in the normal classroom. Several practical suggestions are offered for choosing projects, planning activities, selecting materials, selecting and using tools, sequencing tasks, and eliciting student cooperation. The paper concludes by briefly describing fiscal and administrative support for the program and program evaluation. (NJ)

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INDUSTRIAL ARTS IN SPECIAL EDUCATION

Dale H. Messerschmidt

In looking back some fifteen years at industrial arts literature and comparing it with topics presented at the current convention, it is evident that industrial arts has changed. Recall, if you will, literature from the Sputnik era and the problems we faced in trying to attract quality students to industrial arts. We did things such as change the name Metal Shop I to Metals in the Space Age. We stopped calling the facilities shops and began calling them laboratories. Perhaps some of the changes were for cosmetic purposes, but our curricular changes demonstrate that many programs actually did change. Currently you will note this convention's attentions placed on industrial arts for handicapped and disadvantaged students.

Recently public schools have assumed responsibility for educating the child with problems. Previously families with problem children were able, or even required, to keep the children from the mainstreams of life. Prior to the Kennedy administration attention began being focused on handicapped students, and then during the Kennedy administration monies began to shift to the education of handicapped and disadvantaged students. Today, it is safe to say, most school districts provide some program or facility to educate handicapped children. To illustrate the changing emphasis in education for special children, the U.S. Office of Education reported approximately 442,000 students enrolled in special education in 1948. By 1963 more than one and one-half millions were enrolled. And it was projected that by 1968, thirty-five

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percent of those in need of special education would actually be enrolled in programs. Recently Dr. Frank Broullet, Wasington's Superintendent of Public Instruction, reported that 12.6 percent of all first graders in the state of Washington were found to have learning disabilities. That figure, 12.6 percent, is based on enrollments for the 1975-76 academic year.

In looking ahead at the role of industrial arts in special education, we must keep in mind several factors. To begin, the organization, capabilities, and influences of our society will continue to produce defective children, and or children with problems. While it is indeed correct that medical technology has produced the capability to test for a defective fetus, parents with a high probability of birth defect, are not obtaining the medical advise. Some writers predict that by the turn of the century we may have as many as eleven percent of our children being born with birth defects. Medical technology is now capable of keeping alive many birth defective children who would have died in an earlier period. These children will enter educational facilities of one type or another, and once entered in school, industrial arts has a role to play. It was stated earlier that social influences will contribute to problem children for the schools. I refer specifically to children born of parents who are drug abusers, and children born into unstable family situations. We must educate those children also. What and how to teach special education in the industrial arts facilities is the question.

The literature in special education is replete with pro and con

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discussions on the organization of physical facilities for special education students. While I really do not want to get overly concerned with the arguments of a specific building for special education versus a specific room within the regular classroom building, I do believe we should view the facility topic in terms of industrial arts for handicapped children. Just how important is industrial arts in special education Perhaps your answer to that question will help you decide what opportunities and facilities should be available to special education students. Yes, we can have a self contained special education classroom. But we can have also an industrial arts laboratory available for full time instruction to special education. Let us now look at some of the handicaps which special education students possess.

Student Handicaps:

For purposes of categorizing special education students, we list two levels of retardation-mild and severe. We list also two levels for each of the sensory handicaps - partially sighted and blind, and hard of hearing and deaf. Then we list those with orthopedic and gross motor problems, neurologically impaired, emotionally disturbed, learning disabled, and multiple handicaps. The program in which I participate includes students in all the above categories with the exception of blindness. The only reason there are no blind students in the shop, is because the school has no blind students in the secondary level.

What do we attempt to do with special education students in industrial arts? The answer is relatively simple. We attempt to fulfill the usual

goals stated for industrial arts. And, we also attempt additional goals. Our primary objective is to return all students, who are capable of handling the work, to the regular secondary school. To obtain the goal, our staff, six secondary teachers, meets twice weekly to discuss a student's record, his or her learning problems and where possible to prescribe a series of activities which will lead to amelioration of the specific problem. For example, a student having difficulty in mathematics may benefit greatly from industrial arts participation because we can work on addition, subtraction, multiplication, and division of whole numbers and fractions. In addition the industrial arts teacher can take a minute or two each day to drill students on multiplication tables, addition and subtraction facts. Undoubtedly, the student inadvertently learns a great deal of arithmetic during his layout activities.

The student with social emotional problems is, to this teacher, a greater challenge than the student with only academic deficiencies. For example, we recently took on one case where the child was kicked out of three different schools. The child kicked a principal, knocked a teacher's glasses on the floor and stepped on them, created general disturbances in the classrooms, and had a history of running away. Although the child is only nine years of age, he is permitted in the shop on a reward basis. When he completes his classroom work and behaves himself, we grant him twenty minutes of shop time. This child is bright and a prime example of how the association and identification with shop activities leads to a lessening of his emotional outbursts. We have also secondary age

students with learning problems who resort to delinquent behavior. Usually the secondary age student comes to us from the junior high school.

Sometimes it is necessary to teach industrial arts information to students who cannot participate in the complete gamut of shop activities. Agreed, it is desireable that all students experience all the goals for an industrial arts program; however, there are times when physical impairment prohibits achievement of the goal. Currently our program includes a student with advanced stages of muscular dystrophy, one with neural damage caused by a cerebral hemorrhage during infancy, and several epileptics. The first case is very difficult because the student has only partial use of his right hand. Thus he requires assistance with toilet functions and movements in his wheelchair. He is capable, however, of spreading glue, sanding wood, and so on. Also he can participate in management functions and verbal directions. The case involving the cerebral hemorrhage is a student who has a physically weakened right side. To overcome his weakened state, we have him doing gripping exercises and finger coordination tasks.

Periodically it is possible to use one of our student related needs to achieve an industrial arts goal. Last year we designed and built a rig which permits a child without legs to get himself a drink and to tend a cage of rats. The child was born without legs. He is deaf, and he had intestinal irregularities which necessitated that a colostomy be performed. The unit we designed and built permits the child to roll his wheel chair near a platform, from there he grasps some dowel rods and pulls himself to an erect position. Then by propelling himself with his hands he gets to the water

fountain and a cabinet. Solving real problems facing classmates has been a boom to the egoes of special education students.

Let us now look at some usual industrial arts type activities and compare special education achievement with achievement found in a normal classroom. First, however, let it be understood that special education classrooms are populated with students whose abilities and capacities vary along greater range than do normal classroom populations. Hence, it is necessary that you allow the speaker to generalize when describing capabilities of handicapped students.

Special Education Student's Capabilities:

Industrial arts activities require a fairly uniform series of events to take place. For example, it is necessary for a student to select a task, a project, or a goal and to see that item through to completion. Hence, we may go through events such as selecting a project, planning, layout work, tool selection, tool usage, following instructions, working independently, and working cooperatively. In regular classrooms, some teachers maintain project files from which students are permitted to make a choice. This teacher has no file of projects. He does, however, have many sources of ideas. i.e. Sears Roebuck's Catalog is a major source of classroom information. Not only can the catalog provide dimensions and related information, it can also be used for concurrent learning situations. Finding the item in the index may require a student to read, Other project ideas originate in publications such as House Beautiful, Better Homes and Gardens, toy catalogs, and Popular Science or Mechanics Illustrated. Regardless of the project's

source, I attempt to have a student plan his activities in such a way that he or she understands what is happening along the construction route. Sometimes we meet with good success in developing the bill of materials. For the great majority of students, however, it has been found that the intricacies of a three view drawing are simply too abstract. Therefore, pictorial sketches and the bill of materials are used with greater understanding.

Due to the cost of materials, and the fact that we do not place any direct charges for materials against students, we use large quantities of particle board, low cost paints, and scrounged materials in our woods area. By using particle board we reduce the difficulties of cutting with and across grain patterns. Moreover, a four by eight sheet of particle board is better for layout activities. I think the large sheet provides a better opportunity to teach about the conservation of materials. A few students, however, have absolutely no idea that a manufacturer's edge is a reliable starting point, and therefore they would cut a six inch square from the center of a sheet. It is in the layout activities that we return to the procedures necessary to read rules, to add and subtract both whole numbers and fractions, as well as the new learning in the use of layout tools.

Special education students seem to be no better nor worse than regular classroom students in their ability, or willingness, to select and to use tools appropriately and properly. Early instructional units devote time and effort to explain why a ball peen hammer is used in the metal trades whereas a claw hammer is used in the wood trades. of course there is the occasional lapse and the student uses a ball peen to drive nails. Overall

special education students are really quite good about tool selection.

Because many jobs which are available to special education people are routine and sequential, I attempt to teach students sequential events. For example, think about dish washing, a common job for people with marginal skills. Interruption of the waste food event does cause problems in the dish washing machine. Thus I try to teach students to follow directions, to work in sequence, and to stay with the task. Industry requires each of these items, and it is a responsibility of industrial arts classes to teach special education students to meet the challenge.

During my tenure as a public school industrial arts teacher, one of the most disturbing situations has been that of students vandalizing or pilfering another students' work. So far it has been found that special education students can be controlled in this area. I have found that a potential troublesome student does several inspection trips before he attempts to create a problem. If spotted in time, the student can usually be assigned to assist someone, and once he is involved, the probability of delinquent behavior is reduced.

It seems that special education students are more difficult to get to work cooperatively than are regular students. Thus, I try to create situations in which one student must help another, however, when the students are working together, one hears a large amount of verbal abuse taking place. Derogatory remarkes about each others intelligence is common. I use the communications difficulties between students as learning procedures with students. Why did Joe get angry, or not follow your directions? By putting the teacher's shoes onto the student, there is a learning advantage.

Because we do spend large amounts of time discussing with students the problems of communication, inter personal conflicts, and reaction to one's environment, I find that the industrial arts teacher must be at least as much of a counselor as he is a teacher. Without the student's attention, it is difficult to teach him anything.

Support for the Program:

Fiscal support for the Madrona Heig..ts School prevocational shop program is derived from both local and state funding. We have a regular district, per capita, amount and then we draw a state stipend as well. Within the building, the shop program competes with others, however.

Administrative support within the building and the district has been outstanding. Positive responses to program requirements do occur.

Evaluation:

The teacher assumes all responsibility for the evaluation of students within the prevocational shop classes. There is an estimate made of a students' potential, and several estimates of achievement are gathered in formulating a grade or reward. Each grade is a comparison of the students' achievement with the goals that the teacher has established for the student. For example, everyone is required to identify basic tools and to demonstrate their use. But for trainables I do not require that they differentiate between a ball peen hammer and claw hammer. Better students are required to read micrometers, tap drill charts and to extract information from charts, and to calculate area and cost.

School district policy requires that the building principal evaluate the teacher yearly. In addition to the teacher evaluation a program evaluation

is done by a staff review. Also the state monitors special education through review teams.

Research Projects Underway:

At this time we are operating two separate research studies which fall under the direct supervision of the prevocational teacher. Our first project is titled, "Maturity - a Prerequisite for Training and/or employment." Perhaps you have experience with special education students and realize that their ability to budget and to use time productively is one major difficulty. We use video tape to record a student throughout the day. Our technique is to show the student a filmed interview with two employers. The employers answer three questions: "What do you look for when a prospective new employee comes to your asking for a job? What do you require of the new employee the first day on the job? And, what do you expect of an employee after six months ?" I then sit down with the student and show him/her the employer interview film. I ask the student to compare his/her current skills with the employers requirements. The student then gets to see himself/herself in action. We discuss the students' use of time and establish goals for behavior modification. Later we get a second taping of the student and look for changes.

Our second research grant deals with the preparation of vocationally related reading materials. Currently we have prepared flash cards for carpentry tools, mechanics tools, auto parts, and child care. Also we are rewriting information in child care, cosmetology, mechanics, and building trades. Our purposes in the reading project are two fold. First, we must teach the students vocationally related materials, and second we must teach children

to read.

I now have a series of 35 mm slides which have been taken in our facilities. You will see that this building is deserving of the award it won in the Burlington House Architectural competition.

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Dr. Messerschmidt teaches special education industrial arts in South Kitsap School District, Port Orchard, Washington.

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